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- **Bender, Thomas**
40470 Düsseldorf (DE)
- **Blockhaus, Franck**
42553 Velbert-Neuiges (DE)
- **Heltdress, Rudolf**
42103 Wuppertal (DE)

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(71) Applicant: **Delphi Technologies, Inc.**
Troy, MI 48007 (US)

(74) Representative: **Denton, Michael John et al**
Delphi Automotive Systems,
Centre Technique Paris,
117, avenue des Nations,
B.P. 60059
95972 Roissy Charles de Gaulle Cédex (FR)

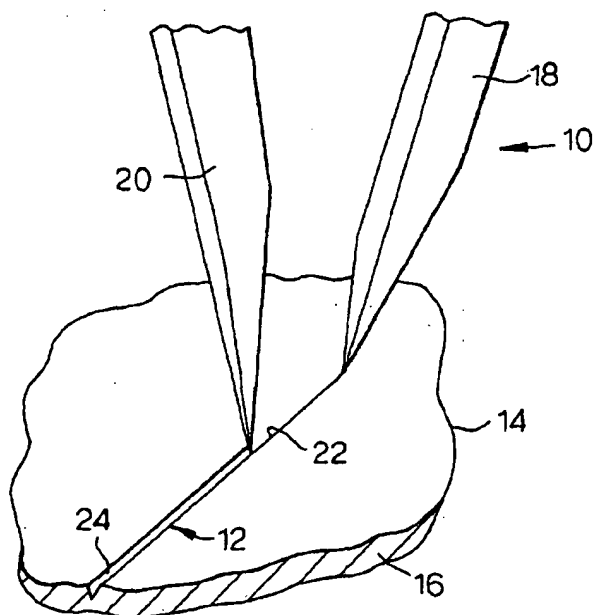
(72) Inventors:
• **Kanksteiner, Udo**
58456 Witten (DE)

(54) Tear seam for vehicle panel

(57) A method of, and apparatus for, forming a tear seam (12) in an interior panel (16) of a motor vehicle comprising the steps of securing the interior panel in a workstation with the inner surface (14) of the interior

panel being exposed; and moving knife means (18,20) across the inner surface to form a tear seam which is substantially V-shaped in cross-section. Achieves accurate positioning the tear seam.

Fig.1.



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Description

Technical Field

[0001] The present invention relates to a method of forming a tear seam in an interior panel of a motor vehicle, and to apparatus for carrying out the method.

Background of the Invention

[0002] An instrument panel of a motor vehicle may include an airbag module mounted behind the panel. The panel includes a door which can open on inflation of the airbag. It is desirable to produce the panel such that the airbag door is hidden or substantially invisible when the panel is viewed by an occupant of the vehicle. It is also desirable to produce the panel so that the position of, and area defining, the tear line for the airbag door is predetermined. To achieve these desires, it is known to form a tear seam in the inner surface of the outer skin of the instrument panel. However, some materials (for example, polyurethane spray skin) used for forming the skin have properties which make the formation of the tear seam difficult, and hence affect the position of the tear when the airbag door opens. In these cases, it has been found that a single knife cut is not sufficient to provide an effective tear seam. Alternative methods, such as the use of a router, have been used but these have the disadvantages of producing a visible line, inaccurate seam formation, and dust creation.

Summary of the Invention

[0003] It is an object of the present invention to overcome the above mentioned disadvantages.

[0004] A method of forming a tear seam in an interior panel of a motor vehicle in accordance with the present invention comprises the steps of securing the interior panel in a workstation with the inner surface of the interior panel being exposed; and moving knife means across the inner surface to form a tear seam which is substantially V-shaped in cross-section.

[0005] The present invention also includes apparatus for carrying out the method.

[0006] The present invention forms a tear seam which is V-shaped, and which is accurately positioned on the inner surface of the interior panel.

Brief Description of the Drawings

[0007] The present invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a perspective view of a first embodiment of apparatus for performing the method of the present invention; and
Figure 2 is a side view of a second embodiment of

apparatus for performing the method of the present invention.

Description of the Preferred Embodiment

[0008] Referring to Figure 1, the apparatus 10 is for forming a tear seam 12 in the inner surface 14 of the skin 16 of an instrument panel of a motor vehicle. The apparatus 10 comprises a workstation; and a first knife 18 and a second knife 20 which are fixed at an angle relative to one another, and at an angle to the inner surface 14 of the skin 16. The knives 18,20 are set to form the tear seam 12 with a substantially V-shaped cross-section. The skin 16 is secured in the workstation by any suitable means, with the inner surface 14 exposed. The knives 18,20 are then moved across the inner surface 14 by any suitable means. The first knife 18 cuts one side surface 22 of the tear seam 12, and the second knife 20 then cuts the second surface 24 of the tear seam to create the V-shape for the tear seam.

[0009] Referring to Figure 2, the apparatus 40 is for forming a tear seam 42 in the inner surface 44 of the skin 46 of an instrument panel of a motor vehicle. The apparatus 40 comprises a workstation, and a knife 48 which is V-shaped. The skin 46 is secured in the workstation by any suitable means, with the inner surface 44 exposed. The knife 48 is moved across the inner surface 44 of the skin 46 and is subjected simultaneously to ultrasonic vibration. As a result, the tear seam 42 is formed with a substantially V-shaped cross-section with minimal cutting force.

[0010] In both of these arrangements, a tear seam is formed which is accurately positioned and is substantially V-shaped in cross-section. The tear seam is substantially invisible when viewed by a vehicle occupant, and is formed by a method which does not create dust. The present invention has particular application for forming a tear seam in a skin formed from sprayed or cast polyurethane or similar materials, and produces an efficient tear seam in materials previously found to be difficult. The present invention may be used for forming a tear seam in any interior panel of a motor vehicle.

Claims

1. A method of forming a tear seam in an interior panel of a motor vehicle comprising the steps of securing the interior panel in a workstation with the inner surface of the interior panel being exposed; and moving knife means across the inner surface to form a tear seam which is substantially V-shaped in cross-section.
2. A method as claimed in Claim 1, comprising the additional step of subjecting the knife means to ultrasonic vibration as the knife means moves across the inner surface.

3. A method as claimed in Claim 1 or Claim 2, wherein the knife means comprises a single knife which is V-shaped, the single knife moving across the inner surface to form the tear seam. 5
4. A method as claimed in Claim 1 or Claim 2, wherein the knife means comprises a first knife and a second knife which are fixed at an angle relative to one another, the first knife moving across the inner surface to form one side of the tear seam, and the second knife moving across the inner surface to form the other side of the tear seam. 10
5. Apparatus for forming a tear seam in an interior panel of a motor vehicle comprising a workstation for securing the interior panel with the inner surface of the interior panel being exposed; and knife means movable across the inner surface to form a tear seam which is substantially V-shaped in cross-section. 15 20
6. Apparatus as claimed in Claim 5, further comprising means for subjecting the knife means to ultrasonic vibration as the knife means moves across the inner surface. 25
7. Apparatus as claimed in Claim 5 or Claim 6, wherein the knife means comprises a single knife which is V-shaped. 30
8. Apparatus as claimed in Claim 5 or Claim 6, wherein the knife means comprises a first knife and a second knife which are fixed at an angle relative to one another, the first knife being movable across the inner surface to form one side of the tear seam, and the second knife being movable across the inner surface to form the other side of the tear seam. 35

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Fig.1.

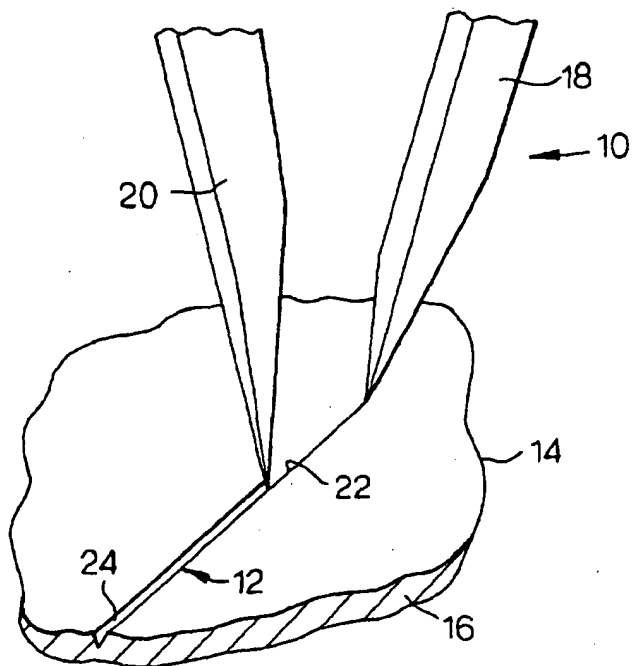
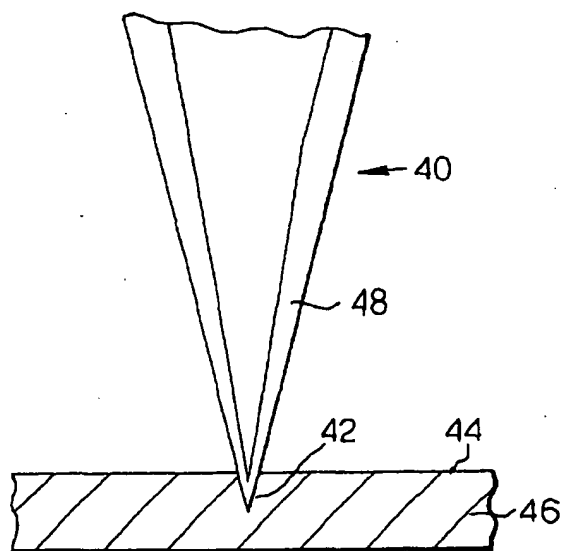


Fig.2.





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 01 20 4545

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 0 967 066 A (TIP ENG GROUP INC) 29 December 1999 (1999-12-29) * column 3, line 43 - line 57 * * column 5, line 22 - line 32; figures 1,6 *	1-3,5-7,	B29C59/00
A	---	4,8	
X	US 4 097 064 A (IKAWA KAZUO ET AL) 27 June 1978 (1978-06-27) * column 1, line 41 - column 2, line 13; figure 1 *	1-3,5-7	
A	---	4,8	
A	DE 199 10 141 A (PETRI AG) 14 September 2000 (2000-09-14) * abstract *	1-8	
A	GB 2 276 354 A (KLIPPAN AUTOLIV SNC) 28 September 1994 (1994-09-28) * abstract *	1-8	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B29C B60R B26D
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 20 March 2002	Examiner Lecomte, D
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 20 4545

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20-03-2002

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0967066	A	29-12-1999	EP	0967066 A2	29-12-1999
			JP	2000033844 A	02-02-2000
US 4097064	A	27-06-1978	JP	52043233 A	05-04-1977
			DE	2643451 A1	07-04-1977
DE 19910141	A	14-09-2000	DE	19910141 A1	14-09-2000
			BR	0008691 A	26-12-2001
			WO	0051851 A1	08-09-2000
			EP	1161362 A1	12-12-2001
GB 2276354	A	28-09-1994	DE	4409405 A1	29-09-1994

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82